REMARKS

Applicants appreciate the Examiner's recognition of the allowance of claim 20 in view of the Terminal Disclaimer filed herewith.

Claims 11-22, as amended, and new claims 23-24 are pending for the Examiner's review and consideration. In the Specification, one paragraph on page 15 has been amended to correct a typographical error. Claim 17 has been amended to correct a grammatical error. Claim 22 has been amended to clarify that this embodiment of the invention relates to transmittance at a wavelength of maximum fluorescence (*See, e.g.,* Specification at page 15, line 11). Claims 23 and 24 have been added to recite preferred embodiments wherein the transmittance is 92.3% to about 96% and wherein it is greater than 92.3% to about 96%. These ranges are supported by, for example, claim 21 and the D_1 value or optical density of the monomer form of the dye, of 0.035. Optical density is expressed by $\log_{10}(1/T)$ where T is transmittance, or percent transmission. Thus, a D_1 of 0.035 (row 2 of Table 2)is equivalent to a transmittance of 92.26% or 92.3%. No new matter has been introduced by any of the amendments or new claims herein, such that entry of the claims is warranted at this time.

Claims 21-22 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,492,792 to Tamura et al. ("Tamura") for the reasons set forth on pages 2-5 of the Office Action.

Tamura is directed to providing an optical recording medium reportedly having excellent sensitivity to light within the near infrared region and greater heat resistance (Col. 2, lines 13-15). The optical recording medium includes a recording layer containing a polymethine dye (Col. 2, lines 36-37). The recording layer may also include a stabilizer (Col. 25, lines 30-31), a binder (Col. 25, 38-40), a plasticizer, an oil agent, or a dispersant (Col. 26, line 66 to Col. 27, line 5). Tamura further teaches that an undercoat layer may be provided between the substrate and the recording layer to improve adhesion between the layers (Col. 27, lines 30-35). The content of dye in the recording layer is generally 1% by weight or more, preferably 40 to 100% by weight, more preferably 50 to 100% by weight (Col. 27, lines 11-15). Tamura discloses various transmittance values in the range of about 20% to about 89% (*See, e.g.,* Tables 2-1, 2-2, 3, 4-2, 5, 6, 7, and 8). The transmittance values were measured at 830 nm (Col. 29, lines 1-3 and 27-28).

On the contrary, claim 21 recites that the transmittance value is about 92% to about 96%, which values were measured at different wavelengths of maximum fluorescence, *i.e.*, from 660 nm to 678 nm (*See, e.g.*, Tables 1-6). Indeed, this is a specific difference in the

claimed article from Tamura, and is not an intended statement of use. Although Tamura discloses a range of only up to about 89% transmittance, a large proportion of Tamura's transmittance values are in the range of 20-30%. Applicants surprisingly and unexpectedly discovered that it was possible to reduce the amount of dye and still achieve a suitable fluorescent composition and optical disc, and that this permitted a surprising increase transmittance according to the present invention. Tamura failed to recognize or suggest the possibility that dye content could be lowered to achieve an operable device with increased transmittance, and therefore fails to disclose or suggest the surprising and unexpected results achieved with the present invention.

Moreover, new claims 23-24 recite preferred embodiments where the transmittance is 92.3% to about 96% and greater than 92.3% to about 96%. Each of these claims is also distinct from Tamura. Accordingly, Applicants respectfully request that this rejection under 35 U.S.C. § 103(a) be reconsidered and withdrawn, as a *prima facie* case of obviousness has not been made on the record.

Claims 11-12, 14, 16, and 21-22 were rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,227,495 to Inagaki et al. ("Inagaki") in view of Tamura and U.S. Patent No. 5,639,588 to Huh ("Huh") for the reasons set forth on pages 6-8 of the Office Action.

Inagaki relates to a reportedly novel cyanine dye compound that can be used as a recording dye for use in optical information recording media (Col. 1, lines 7-11). The recording layer includes the dye and may also include a "quencher" for improving light fastness, a binding agent, an oxidation inhibitor, a UV absorbent, a plasticizer, or a lubricant (Col. 14, lines 42-46 and 61-64). When the binding agent is included in the recording layer, the amount of the cyanine dye may generally be from 0.01 to 99% by weight, preferably from 1.0 to 95% by weight, based on the weight of the binding agent (Col. 15, lines 14-18). Concentration of the dye in the recording layer may generally be from 0.01 to 10% by weight, preferably from 0.1 to 5% by weight (Col. 15, lines 18-21).

Huh relates to an optical recording medium that includes a substrate, a recording layer of a dye-containing recording material on the substrate, a reflective layer, and a protective layer disposed in sequence on the recording layer, characterized in that the recording layer has a refractive index of 1.7 or less and includes an organic dye and a mixture of two or more polymers which have different thermal properties and are compatible with each other from ambient temperature to 80°C (Col. 2, lines 21-29). Huh teaches that an effective amount of organic dye as a light absorbent should be mixed with the optical

recording material (Col. 3, lines 38-42). The preferred addition amount of the dye is 1.0-30 wt.% based on the total polymer material (Col. 3, line 43-46). If the amount of dye is less than 1 wt%., the light absorption is too weak and the power of the recording light would need to be increased uneconomically (Col. 3, lines 46-48). Meanwhile, if the amount exceeds 30 wt%, a part of the dye having low solubility might not be dissolved and consumption of a large amount of the expensive dye results in uneconomical manufacturing (Col. 3, lines 48-52).

Tamura discloses that the content of the polymethine compound in the recording layer is generally 1% by weight or more, preferably 40 to 100% by weight, more preferably 50 to 100% by weight (Col. 27, lines 11-15). Importantly, Tamura expressly states that with a dye content of more than 40% by weight, a recording layer exhibiting sufficient light absorption and sufficient reflectance for a reproduction laser beam can be obtained (Col. 27, lines 16-18). Tamura is stated to be relied upon for its teaching of surfactants and a primer layer.

The Office Action concludes that it would have been obvious to add a binder, a surfactant, a plasticizer, and a primer layer to Inagaki, based on the teachings of Tamura and Huh (Office Action, page 7). The Office Action also maintains that it would have been obvious to form a dual recording media based on the teachings of Inagaki and Tamura (*Id.* at pages 7-8).

On the contrary, while Inagaki and Huh teach lower dye concentrations, Tamura effectively discourages and *teaches away* from this use. It is clearly an improper hindsight rejection for the Patent Office to pick and choose which teachings of Tamura to combine with Inagaki and Huh. Instead, the teaching of Tamura as whole must be applied. "A prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention." *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Although Tamura states that the concentration of dye in the recording layer is generally 1% by weight or more, Tamura states immediately thereafter that a fluorescent composition ***must*** *have a dye concentration of more than 40%* to exhibit *sufficient* light absorption and reflectance for a reproduction laser beam to be obtained. Thus, Tamura teaches that amounts over 40% of dye must be included for its invention to even be operative, and suggests that lower amounts of dye render the device inoperable. Tamura effectively teaches that the recording layer must have at least 40% dye to function. Indeed, given the overly broad ranges of dye disclosed in Inagaki and Huh, those of ordinary skill in the art

would have reasonably relied on the particular and clear teaching in Tamura not to use such low dye amounts in an effort to avoid inoperability. Such ordinary-skilled artisans might even avoid entirely the suspect "teaching" of Inagaki as being so broad as to dye content as to be useless in providing guidance, and instead rely on Huh and/or Tamura.. Therefore, Tamura clearly *teaches away* from the lower amounts of dye taught in Inagaki and Huh, as well as the 0.1 weight percent to 10 weight percent fluorescent dye recited in independent claims 11 and 17.

Moreover, Huh expressly rejects the use of the higher dye concentrations of Tamura. Amounts of dye greater than 30 wt%, based on the total polymer material, may result in a part of the dye having low solubility not fully dissolving and consumption of a large amount of expensive dye. This results in uneconomical manufacturing (Col. 3, lines 46-52).

Therefore, there is no motivation to combine Huh with Tamura, and Huh specifically *teaches away* from Tamura as well. It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). One of ordinary skill in the art would not have been motivated to combine the teachings of Tamura with Inagaki or particularly with Huh, because of the distinctly different useful amounts of dye that are taught in the references. The cited references teach away from their combination and Tamura further teaches away from the claimed invention with respect to dye content. Applicants therefore respectfully request that this rejection under 35 U.S.C. § 103(a) be reconsidered and withdrawn, as a *prima facie* case of obviousness has clearly not been made on the record.

Claims 11-14, 16-19, and 21-22 were rejected under 35 U.S.C. § 103(a) as obvious over Inagaki, in view of Tamura and Huh, and further in view of U.S. Patent No. 5,283,094 to Sasakawa et al. ("Sasakawa") for the reasons set forth on page 8 of the Office Action.

Initially, Sasakawa fails to remedy the hindsight rejection and the deficiencies of the primary and secondary references Inagaki, Tamura, and Huh, as discussed above. Sasakawa fails to provide guidance as to a suitable amount of dye to help remedy the deficiencies. Sasakawa is directed to the amount of solvent remaining in a recording layer and the drying conditions after forming the recording layer to achieve its reported invention (*See, e.g.,* Col. 2, lines 6-10). The drying temperature is preferably 100°C or lower taking the heat resistance of the substrate into consideration (Col. 8, lines 1-3). Sasakawa therefore focuses more on the percentages of solvent in preparing the recording layer, rather than the

amount of dye. Sasakawa does, however, state that the concentration of the phthalocyanine *dye solution* in the optical recording medium is usually 0.1-10% by weight, preferably 0.5-7% by weight although it varies depending on types of solvent and methods for forming the recording film (Emphasis added) (Col. 6, lines 44-48).

Of course, the present claims are directed to a final article rather than concentrations of an ephemeral solution used during processing, as taught by Sasakawa. In addition to the phthalocyanine dye, other compounds, such as known aromatic or unsaturated aliphatic diamine type metal complexes, aromatic or unsaturated aliphatic diol type metal complexes, polymethine dyes, squarylium dyes, naphthoquinone type dyes, anthraquinone dyes or the like may be added in an amount of preferably 30% by weight or less, more preferably 20% by weight or less (Col. 6, lines 50-56). The total amount of the phthalocyanine dye and the above-mentioned dyes capable of being used together with the phthalocyanine dye in the recording layer is usually at least 80% by weight, preferably 90-100% by weight, more preferably 95-100% by weight of the recording layer (Col. 7, lines 20-25). Correspondingly, Sasakawa teaches to use small amounts of resin and additive in the layer, with the combination typically being present in less than 20 weight percent, preferably less than 10 weight percent, and more preferably less than 5 weight percent of the recording layer (Col. 7, lines 16-19). This is because higher amounts of resin and additive are taught by Sasakawa to make the reflectivity and recording sensitivity poor (Col. 7, lines 12-15).

As can be seen from the discussion above, Sasakawa fails to make the references combinable. In fact, Sasakawa reinforces Tamura's teaching of large amounts of dye, even expressly disclosing that high amounts of resin and other additives over roughly 20 weight percent of the fluorescent composition result in poor recording sensitivity. Therefore, Sasakawa suggests that dye concentrations of at least 80% are desired to minimize the undesired effects of large amounts, *i.e.*, more than 20%, of resins and other additives. Thus, Sasakawa also *teaches away* from the claimed invention and from the dye content taught by Huh. In fact, Sasakawa simply adds to the confusion in the art as to what dye content is useful for a particular application or end result. Moreover, Sasakawa does not teach or suggest the claimed transmittance values in claim 21.

Consequently, as explained above, there is no motivation to combine Inagaki or Huh with Tamura. There is also no motivation to combine Inagaki or particularly Huh with Sasakawa, because Saskawa recommends using higher amounts of dye to reduce the risk of poor reflectivity and recording sensitivity. Therefore, one of ordinary skill in the art would not have combined Inagaki with Tamura, Huh, and Sasakawa because the references teach

away from their combination. Accordingly, Applicants respectfully request that this rejection under 35 U.S.C. § 103(a) be reconsidered and withdrawn, as a *prima facie* case of obviousness has not been demonstrated in the record by the disparate cited references.

Claims 11-19 and 21-22 were rejected under 35 U.S.C. § 103(a) as obvious over Inagaki, in view of Tamura and Huh, and further in view of Sasakawa and U.S. Patent No. 4,904,574 to Suzuki ("Suzuki") for the reasons set forth on pages 8-9 of the Office Action.

Suzuki is concerned with the stabilization of organic base materials to light, and more precisely to the stabilization of organic compounds, especially organic dyes, and polymeric materials, to light (Col. 1, lines 5-10). The organic base materials include dyes that are used for high density optical recording, for example, as recording media for optical discs (Col. 32, lines 3-8). Suzuki discloses diethylene glycol as an organic solvent to be used in conjunction with high boiling solvents for dispersing the dyes (Col. 38, lines 42-43). It teaches that, in general, the dye concentration should be equal to the concentration normally used for color photography (Col. 39, lines 19-21). The presence of the dye in amounts within the range of about 10 to 10^4 micromol per square meter of light-sensitive material is preferred, and most desirably dye is present in an amount within the range of about 100 to 3 $x10^3$ micromol per square meter of light-sensitive material (Col. 39, lines 22-28).

The teachings of Suzuki do not provide the requisite motivation to combine Inagaki with Tamura, Huh, and Sasakawa. Simply put, the teachings of Tamura and Sasakawa are incompatible with the teachings of Inagaki or Huh, and the references therefore teach away from their combination. Suzuki fails to remedy any of the deficiencies noted here, and simply helps illustrate that the rejections involving these references are based on impermissible hindsight. Suzuki also fails to teach or suggest the claimed transmittance values of about 92% to about 96% as recited in claim 21. Accordingly, Applicants respectfully request that this rejection under 35 U.S.C. § 103(a) be reconsidered and withdrawn as no *prima facie* case of obviousness has been made—or can be made—on the record as to these references.

Claims 11-22 were rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-26 of U.S. Patent No. 6,835,431 and claims 1-44 of U.S. Patent No. 6,682,799, each in view of Tamura. Applicants have submitted a Terminal Disclaimer in response to these rejections. Accordingly, these rejections have been overcome and should be withdrawn.

Claims 11-22 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 9-27 of U.S. Application No. 10/917,384 (U.S. Publication No. 2005/0013966) in view of Tamura. As the rejection is only provisional in view of the pending status of the '384 application, Applicants do not address the '384 application at this time. Should the '384 application issue before the present application is ready for issuance, Applicants will consider submitting a Terminal Disclaimer at that time.

Accordingly, the entire application is now in condition for allowance, early notice of which would be appreciated. Should the Examiner not agree with the Applicants' position, then a personal or telephonic interview is respectfully requested to discuss any remaining issues and expedite the eventual allowance of the application.

Respectfully submitted,

Oct. 11, 2005
Date

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